

Arrival Distribution Descriptions

Overview

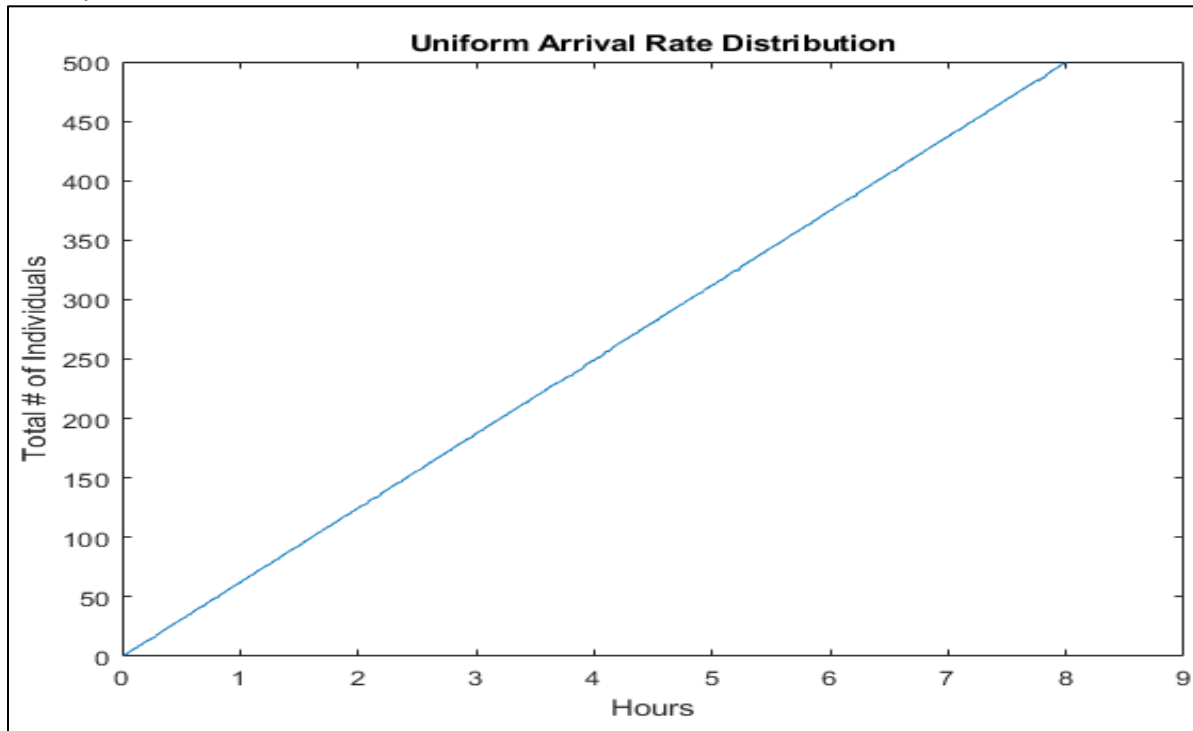
This document will go through each of the arrival distribution options providing an example of when they should be used. Currently Uniform is the only option but others will be added in the future.

- Uniform
- Poisson
- Front loaded
- Stair Stepped

Uniform (Constant) *Default*

The default arrival distribution is a **Uniform** distribution. Using a Uniform arrival rate is a good starting point when estimating throughput capacity. Think of this as a steady rate of people over the course of your shift.

An example of how a Uniform arrival would look over the course of a shift is shown below.



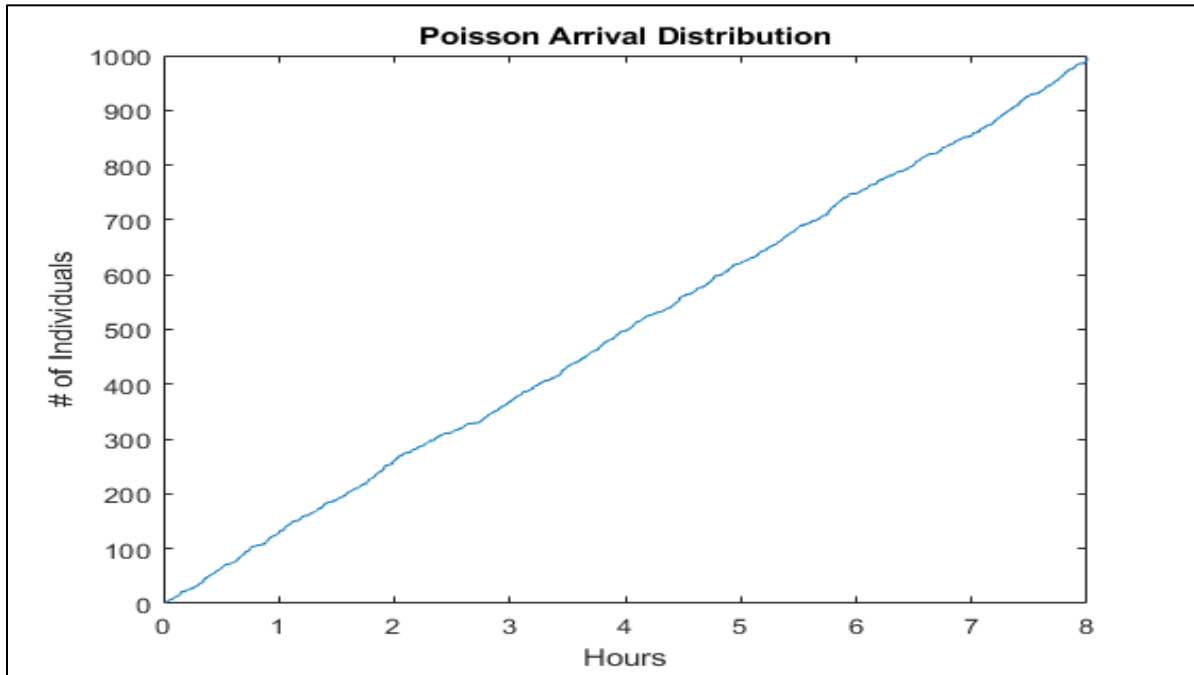
An example of how to calculate this arrival rate is:

Over an 8-hour shift, 1000 people are set to arrive. This means that each hour, we would anticipate 125 people to arrive. 2-3 people will arrive about every minute.

Poisson (Statistical Standard)

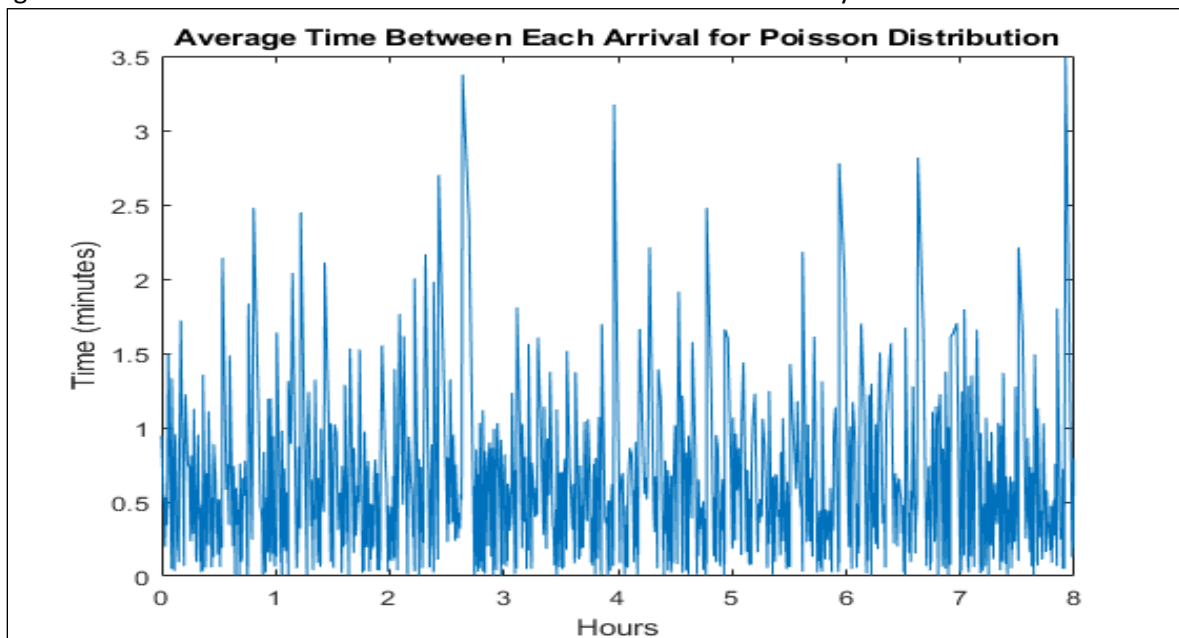
Poisson is a common distribution used when modeling arrival rates. This distribution predicts the likelihood of a person arriving over a certain period given that we know an average arrival rate. Individuals are most likely to arrive around the average arrival time.

An example of how a Poisson arrival would look over the course of a shift is shown below.



An example of how to calculate this arrival rate is:

Over an 8-hour shift, 1000 people are set to arrive. This means that each hour, we would anticipate 125 people to arrive. On average, we expect one person to arrive every 30 seconds. Some individuals may arrive within 15 seconds of each other while others may arrive within 1-2 minutes of the other. This range of arrival time accounts for the randomness of how individuals may arrive at a CRC.



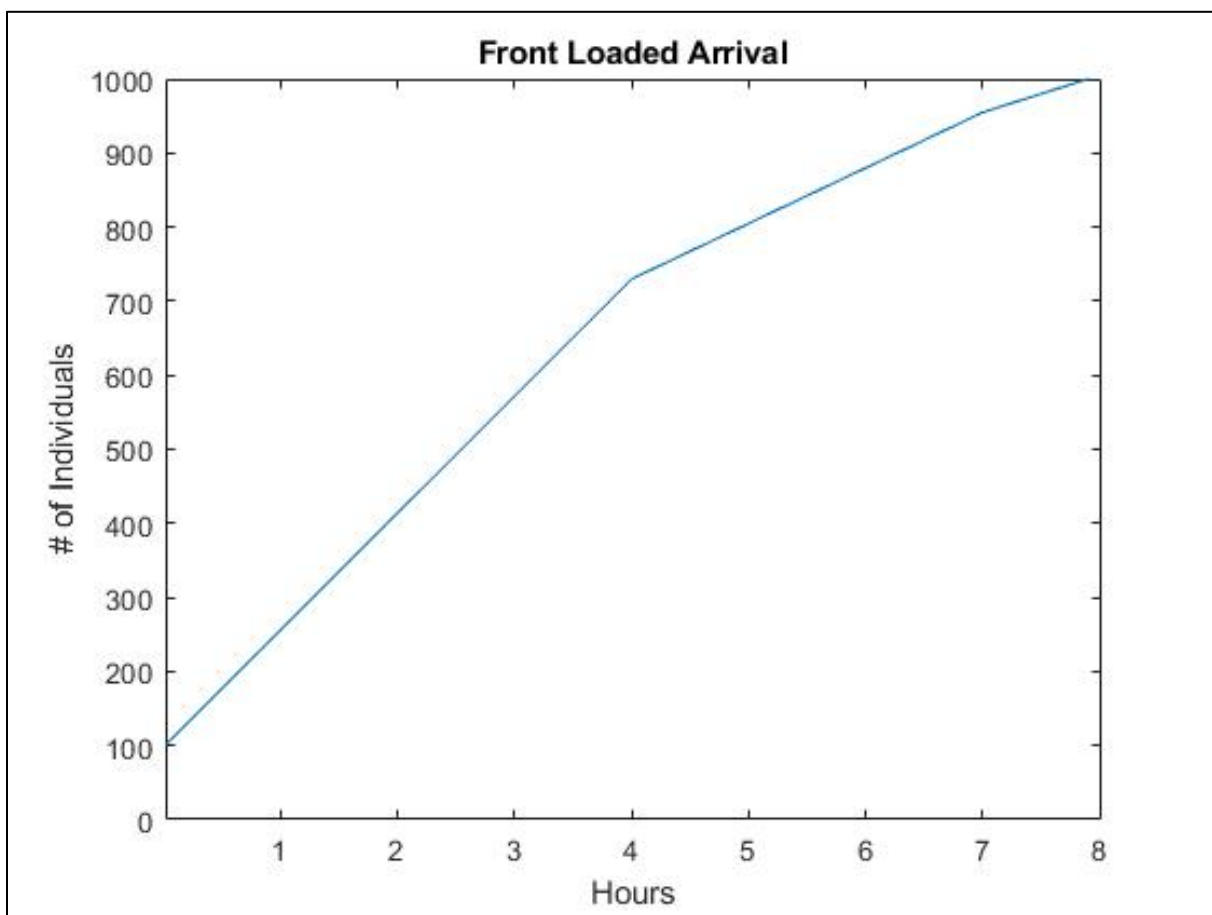
Front Loaded (Opening Line)

A **front-loaded** arrival distribution starts with a certain number of people already at the door at the opening of the CRC. As the CRC remains open, people continue to arrive but less and less as the end of the shift grows near.

Think of it like this like a ticket sale booth where people arrive before the opening of sales so that they are more likely to get a ticket.

When would you use this arrival distribution option? If plans are in place for pre-communication or early messaging about where and when the CRC will open, it is possible that a line will build prior to the CRC opening.

An example of how a Front-Loaded arrival would look over the course of a shift is shown below.



An example of how to calculate this arrival rate is:

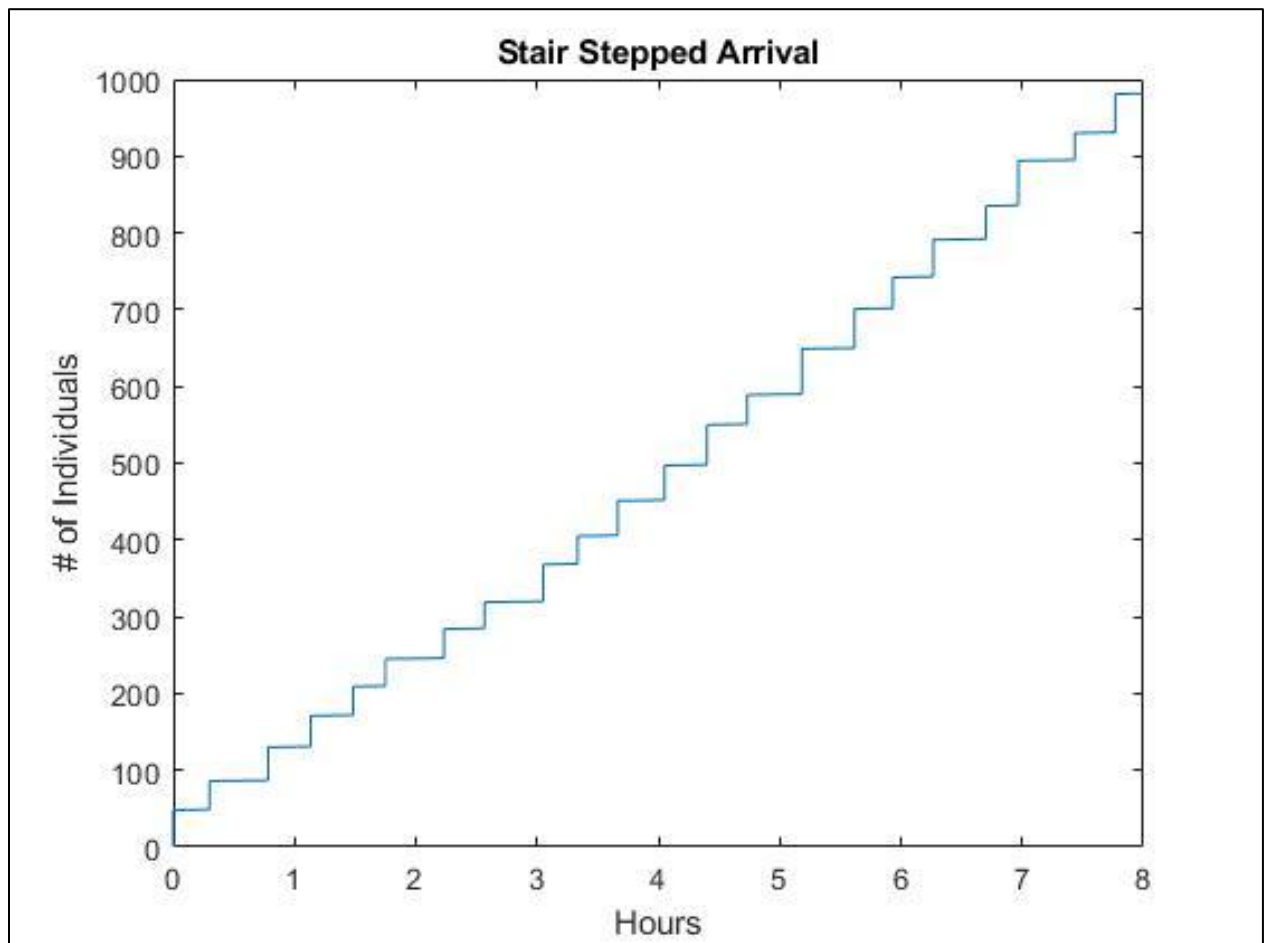
Over an 8-hour shift where we anticipate 1000 people to arrive, we will assume that 100 or 10% of the total population will be in line at the beginning of the shift. As the shift progresses, less and less individuals will arrive.

Stair Stepped (Bus Loads)

A **stair stepped** arrival distribution represents a situation where people are being directed from other areas and transported in groups via bus loads. Another way to use this distribution would be if CRCs had plans in place for individuals to schedule appointment slots where people would be expected at certain times throughout the shift.

When would you use this arrival distribution option? If the anticipated response would involve scheduling appointment times to arrive at the CRC or if people were being evacuated by bus loads from other areas.

An example of how a stair stepped arrival would look over the course of a shift is shown below.



An example of how to calculate this arrival rate is:

Over an 8-hour shift where we anticipate 1000 people to arrive, we will assume that each bus load can have between 30-60 individuals and 1-3 bus loads may arrive within the same hour. This means that 30-180 individuals could arrive each hour.